

# Egialea Survey Project: Method and Strategies

Alfonso Santoriello<sup>1</sup>, Francesco Scelza<sup>1</sup> and Roberto Bove<sup>2</sup>

<sup>1</sup> University of Salerno, Department of Cultural Heritage, Laboratory of Archaeology “M. Napoli”

Fisciano-Salerno, Italy  
{asantori@unisa.it, frul72@yahoo.com}

<sup>2</sup> Independent Software Developer  
(icmnetwork@libero.it)

**Abstract.** This paper describes the project of survey in Egialea (Greece) – a collaboration among the VI Eforia to the Prehistoric and Classical Antiquities of Patras, the Italian Archeological School of Athens, the KERA, and the Department of Cultural Heritage of the University of Salerno – issued from the demand to contribute to the knowledge of Oriental Acaia territory. It focus on survey's method based on advanced technological tools, integrated with traditional examination techniques. In detail, it deals about the issue of the formulation of an intervention coherent with territory's reality, research's goals and human and instrumental resources available.

## 1. Introduction

The goal of Egialea survey project was to contribute to the knowledge of Eastern Acaia, the first establishment of Western Greek colonies.

The survey's area was taken from the river basin of the Krios. The river drains into a wide basin of about 100 km<sup>2</sup>, to the east is the massive, inaccessible Mount Evrostina (about 2000 meters high.). The valley is filled with numerous crossing streams and brooks flowing into the Krios creating deep trenches with in the valley. The form of the basin is asymmetrical: The right side of the basin has a steep slope which rarely gives away to flat spaces. On the left side, the basin is formed with alternating wide and tall plateaux, giving spaces for the villages of Ambelokipi and Chrysanthion, as well as plateaux, there are many rough relieves. In the inter most part of the Krios the valley narrows near the village of Seliana, from here the landscape changes into the open Arcadia.

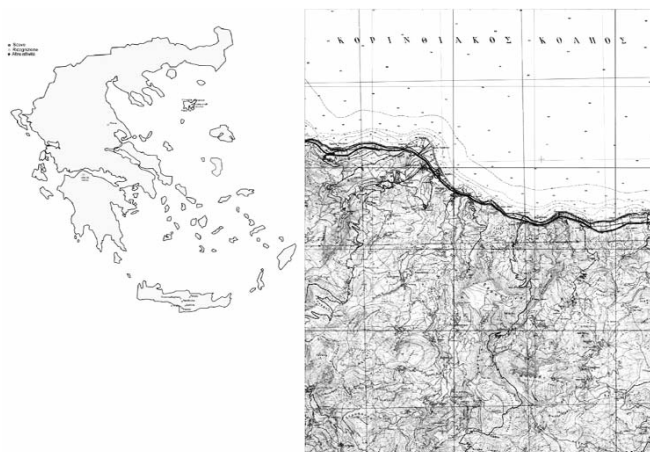


Fig. 1. Eastern Acaia.

## 2. Method and Strategies

### 2.1 Preliminary Studies

The preliminary maps, with different scales, were composed from cartography and aerophotographies combined with historical and bibliographical sources.

On the maps are shown, simplified, the physical, morphological, and hydrogeological characteristics of the territory, and a series of simple intermediaries factors (grass-weed-crop-marks, damp-marks, shadow-sites). These elements are useful to determine, inside an area with different morphological aspects, the sub-areas object of anthropical changes and those needing the survey. Moreover these elements are useful to optimize scheduling time and human resources involved too.

The stereoscopic reconstruction of the pictures and the arranging of photomosaic from these pictures, allows to discover traces from anomalies on the ground's surface related to geological aspects and anthropic activities.

### 2.2 Survey Methodology

The survey methods employed were based upon systematic and asystematic strategies with extensive and intensive character. The aim of the asystematic survey, was to acquire wider knowledge of territory along both sides of the Krios, while at the same time to georeference archaeological evidence noted in bibliography and also known spoken about in traditional stories around the area.

The systematic survey was used in a sample area on the left side of the Krios: starting from the idthrographical shallow, into the sectors placed between the Sarakinovouni hill to the North, Ambelokipi Village in the South and the border of Vlachos to the East.

The sample aera is a coherent, significant, part of the whole territory of about 10 km<sup>2</sup>, it's a reduced scale of geological, geomorphological and orographical characters of a strip of land between the hills and the Krios.

The aim is to create a stratigraphical scheme of natural and anthropic activities, that through the course of time determined different landscape.

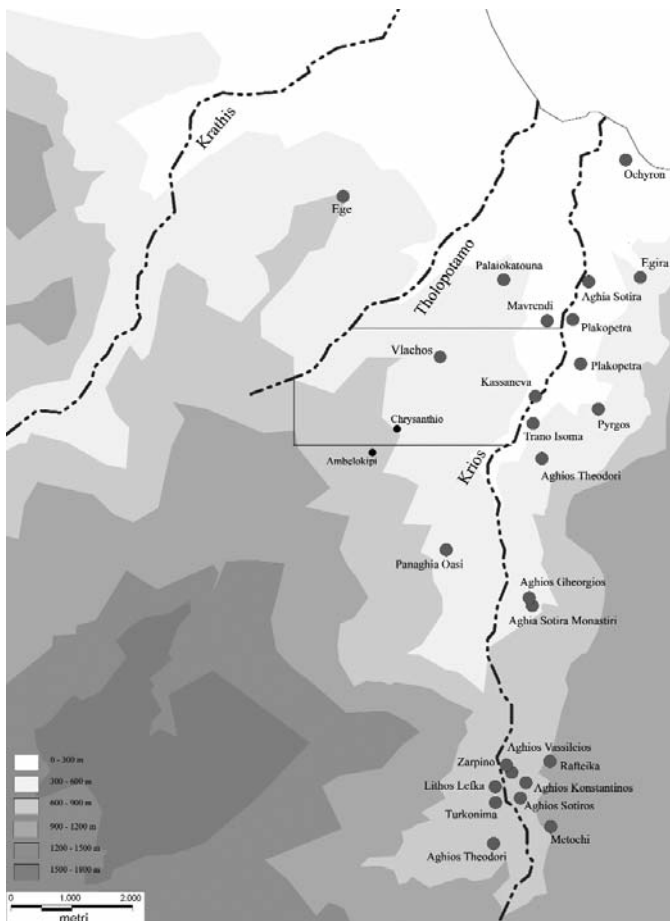


Fig. 2. Asistematic and systematic survey's areas.

### 2.3 Data Modelling

The area of the basin of the Krios is delineated in a theoretical grid. This last one is divided in 5 Km quadrangles (quadranti). Each quadrangle is identified by 4 couple of coordinates and an alphanumeric code. Then they are divided in 100 squares of 500m side, codified with a clockwise numeric code .

The second step following the division in squares was to locate limited “working-spaces”, homogeneous and coherent with the actual structure of the modern landscape. Easily to be recognized on the field, they were located having considered the territory's morphology and its use.

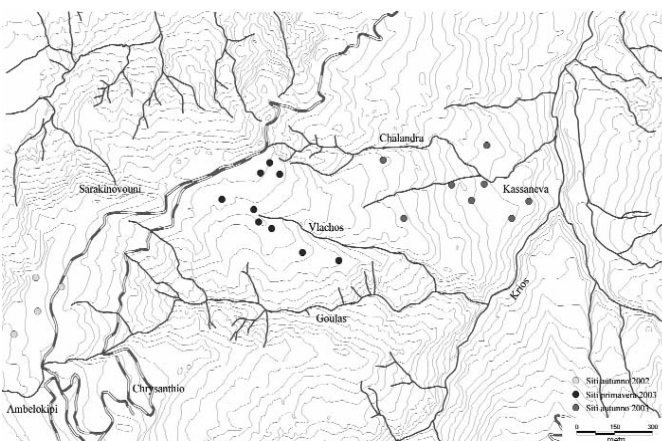


Fig. 3. The systematic survey's area in detail.

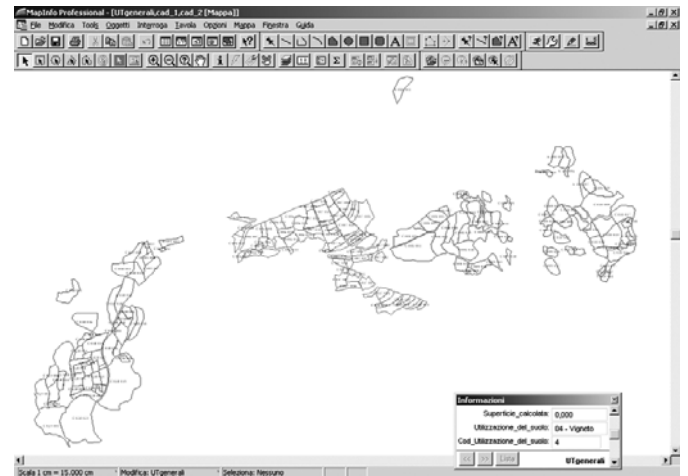


Fig. 4. UT definition.

These “spaces” are defined as “survey's topographic unit” (UT), and are identified by an alphanumeric code formed by Quadrangle ID, Square ID and a progressive number. Therefore UT classification is based upon soil's surface and conditions, and visibility degree.

The choice to make use of a division fixed considering the real aspects and dimensions of each field, in addition to a theoretical one, was believed to be the most fitting. The aim was to avoid an extremely abstract, geometrical, composition. In our way of thinking, the real characteristics of the territory must be the most immediate reference to the statistical-quantitative analyses and calculation insertion, such as: density, finds percentage, quality of the findings.

The reconnaissance areas and the recoveries, prospected with the aid of different collections methods, have been measured by GPS, supported with a receiver connected to a geostationary satellite. Regarding the intra-site investigation, in order to to the geolocalization and survey of archaeological evidencies, such as structures and scatter's fragments areas, we utilized a GPS-Glonass L1-L2 (double channel) instrumentation. This device is distinguished by a great accuracy, the possible error is in the scale of centimeters. The survey was accomplished in static mode to realize the the topographical grid, and in cinematic mode to take other measures.

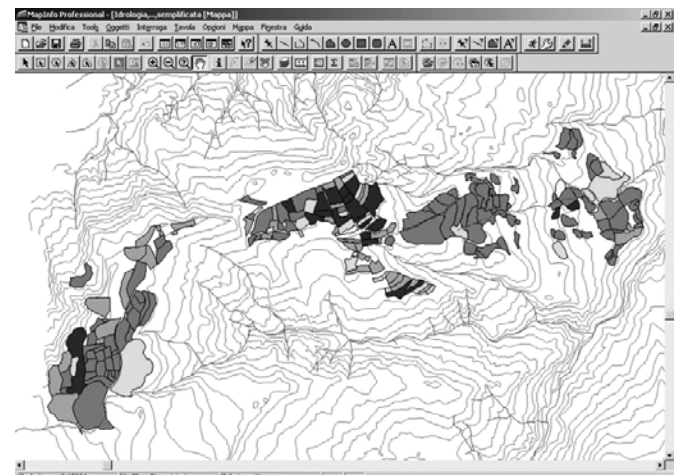


Fig. 5. UT classification: visibility degree.

The systematic territory's reconnaissance and its graphical and literary restitution – developed to the aim to redefine the detail's cartography of the present landscape conformation (1:5000) – has constituted the basis for the elaboration of thematic maps, classified into GIS platforms.

The final outcome, in relation to the survey data (visibility, density, cronology), is a spatial landmark system for multi-dimensional calculation of varied informations: dimensions, recoveries, survey's parameters, tipology and ammount of the findings.

## 2.4 Topographical and Cartographical Data Management

The use of dedicated software helped us to specify a unitary level of data management and analyses, structuring an archaeological and geographical system of information.

During the starting period we made use of a 1:50000 map, useful to a first geographical and morphological background [frame] of the recognition areas. This map constituted the basis for the geolocalization of further cartographical detail documents, aerophotos, archaeological and topographical GPS referenced data.

The geolocalization process has demanded a preliminary work on the local projections systems. The system known as HGRS87 or EGSA87, utilize a “hybrid” projection. The geographical coordinates (longitude and latitude) are relative to the WGS84 datum ; geometrical coordinates (E and N) are referenced to the local system, based upon the GRS80 Ellipsoid and Dioniso datum (alteration of the international GRS80 datum). Before, in Greece was adopted the HATT system with equidistant azimuthal projections, Bessel ellipsoid, hellenic datum with the origin point at the National Observatory of Athens.

## 2.5 Acaia Survey Database

The entire process to collect, record and analyze informations on survey is based on the Acaia Survey Database; this software was produced, and still is in progress, to accomplish the request of an integrated GIS-independent and multi-platform Database on survey.

This software runs in Windows and Apple operative system, is multiuser and can publish data on the web (will be in a future implementation).

There are two distinct types of data to collect in the same or different time: the coordinates recorded in the GPS device and the informations coming from the survey's data form.

The coordinates are imported in a GIS and then exported to the Acaia Survey Database.

The survey's data form are filled during the survey, then the informations are loaded in the database.

In this way the operations of collecting and loading data related to the description of the topographical units are distinct from geographical and geometric definition of the survey context.

The two distinct data input can be processed on two or more different workstation in different time and in different location. This is possible thanks to an “interchange file” to share and exchange data between distributed databases and, in the same manner, with the GIS devoted to spatial analysis.

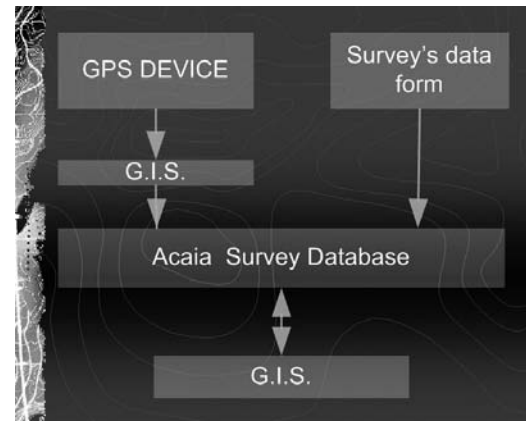


Fig. 6. Data flow.

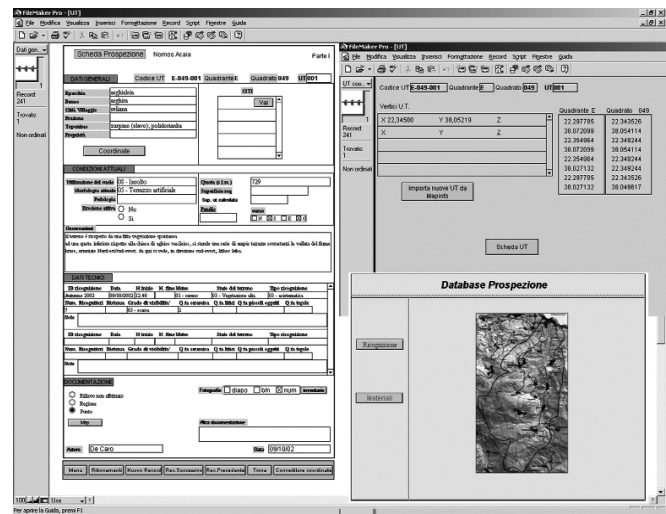


Fig. 7. Database form.

The database is based on a relational architecture that allow to store and retrieve informations according to recording and analysis criteria defined in survey's methodology.

In particular, the UT record is defined with some “stable” elements related to landscape (morphology, soil condition, toponomastic, and so on) and other variables characters related to kind and period of survey.

An UT record may be related to multiple survey record and a single survey may be related to multiple UT records.

Primary goal in software development was to made a database not dependent from the GIS used to represent geographical and survey data. The database can operate with every GIS thanks to its structure that records independently GPS data and survey data; every element that needs to be recorded is associated with its geographical data coming from the GPS.

The geographical and survey data, related to each element, can be exported to a GIS that allows qualitative and quantitative analysis.

The data imported in the GIS can be manipulated and then exported to database.

This new set of informations imported in the database represent a new support to analysis. The informations are re-classified trough statistical-spatial calculation to be useful to find real archaeological entity.

The database was developed with Filemaker Pro, a multi-platform RDBMS . To allow the communication with the GIS

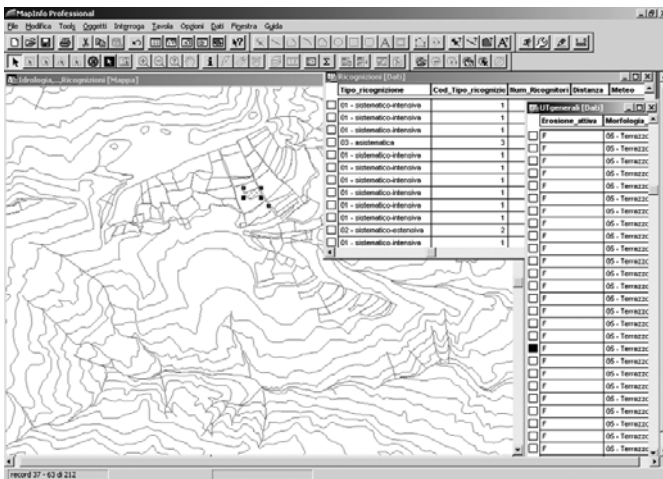


Fig. 8. GIS data import.

Mapinfo, were created import and export function in MIF format (Mapinfo Interchange Format) . These function are based on a data repository to maintain independence from the GIS. The data repository contains the definitions for every geographical object to be exported. It's possible to add new geographical object to define new procedure to export to and import from different GIS. ODBC connection are not implemented to avoid the needs to connect at the same time

the GIS and the database that can run on different computer, not connected on a network, and in different time. The implementation of an import/export file make available data processing and data exchange on workstation independent from time and place.

## References

- Bintliff, J. and Snodgrass, A. M., 1988. Mediterranean survey and city. *Antiquity* 62, 57–71.
- Gallant, T. W. 1986. Background Noise and Site Definition: a Contribution to site Methodology. *JFA* 13 (4), 403–418.
- Greco, E. (ed.), 2002. *Gli Achei e l'identità etnica degli Achei d'Occidente, Atti del Convegno Internazionale (Paestum, 23–25 febbraio 2001)*, Paestum-Atene.
- Macready, S. and Thompson, H. (eds), 1985. *Archaeological Field Survey in Britain and Abroads*. Society of Antiquaries Occasional Papers 6, London.
- Petropoulos, M. and Pontrandolfo, A. and Rizakis, A. D. 2004. Prima campagna di ricognizioni archeologiche in Egialea (settembre-ottobre 2002). *ASAtene* LXXX, serie III, tomo II, 939–965.
- Rizakis, A. D. (ed.), 1992. *Paysages d'Achaïe I. Le bassin du Peiros et la plaine occidentale*, Athènes.